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THE
ONTARIO WATER RESOURCES
COMMISSION
WATER POLLUTION SURVEY
OF THE
TOWN OF PETROLIA
COUNTY OF LAMBTON

1964

STANDARDS DEVELOPMENT BRANCH OMOE
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TOWN OF PETROLIA 1964
COUNTY OF LAMBTON

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Report on water pollution
survey of the town of Petrolia,
county of Lambton.

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Report on

WATER POLLUTION SURVEY

TOWN OF PETROLIA

County of Lambton

October 1964

The Division of Sanitary Engineering

GENERAL

A water pollution survey of the Town of Petrolia was conducted by representatives of the OWRC on July 21, 1964.

Information pertaining to the municipal drainage system was provided by Mr.H.J. Coke, Works Superintendent, who assisted in the investigations. The survey was also reviewed with Mr.H.G. Kerby, Clerk-Treasurer.

The investigations included the locating of surface-water drains and the sampling of the effluents. The receiving watercourses, Bear Creek and tributaries, were also sampled. The probability of pollution resulting from the oil drilling operations in the area was also considered.

OWRC OBJECTIVES

In order to interpret the laboratory analyses of samples, the OWRC objectives are given. The objective for a clean stream is a maximum of 5-Day Biochemical Oxygen Demand (BOD) of 4 parts per million (ppm). Storm sewer effluents should not exceed 15 ppm BOD. It is suggested that a coliform count in excess of 2,400 per 100 ml in a stream is indicative of pollution. The presence of detergents is often related to sanitary sewage. There are also suggested standards for industrial wastes. Oil or ether solubles should not be present in industrial drain discharges in excess of 15 ppm. Phenols, or phenolic equivalents, should not exceed 20 parts per billion (ppb) in drain effluents. All analyses except pH are reported in parts per million unless otherwise indicated.

SURFACE WATER DRAINS

The various outlets investigated during the survey are designated by mileage points which are indicated on an accompanying map of the town.

OUTFALLS DISCHARGING INTO BEAR CREEK

SYN 41.4W Princess St. storm sewer. This drain was reported to serve a considerable section of the town.

5-Day BOD (ppm)	Total (ppm)	<u>Solids</u>		Anionic Detergents as ABS (ppm)	M.F.Coliform Count per 100 ml
		Susp. (ppm)	Diss. (ppm)		
72	2,072	100	1,972	4.0	68,000,000

These results revealed serious pollution.

SYN 42.10W (Old Drain) and SYN 42.12W (New Drain) First Ave. drain outfalls. Samples were obtained at a junction box near First Ave. and Sixth St. The old drain discharges south from the junction box and then west into Bear Creek. The new drain discharges directly west to the receiving watercourse.

5-Day BOD (ppm)	Total (ppm)	<u>Solids</u>		Anionic Detergents as ABS (ppm)	M.F.Coliform Count per 100 ml
		Susp. (ppm)	Diss. (ppm)		
145	940	420	520	9.0	11,000,000

These results reveal the presence of strong sanitary wastes.

SYN 42.3W Walnut St. storm sewer. The drain discharges into the former course of Bear Creek. The course of the stream was recently changed. However, the former course continues to discharge

into the main stream.

5-Day BOD (ppm)	<u>Solids</u>			Anionic Detergents as ABS (ppm)	M.F.Coliform Count per 100 ml
	Total (ppm)	Susp. (ppm)	Diss. (ppm)		
37	436	46	390	4.6	73,000,000

Sanitary sewage was evident in the drain effluent.

SYN 42.7D.I. Tank St. open drain. The watercourse drains into the former course of Bear Creek and eventually into the main stream. There appeared to be a heavy concentration of oil in the drain at the time of inspection.

Chemical Oxygen Demand (COD) (ppm)	<u>Solids</u>			Phenols in (ppb)	pH at Lab.	Ether Solubles (ppm)	Anionic Detergents as ABS (ppm)	M.F.Coliform Count per 100 ml
	Total (ppm)	Susp. (ppm)	Diss. (ppm)					
4,080	16,304	52	16,252	0	6.8	5	0.7	20,000

These results indicated the presence of industrial wastes

SYN 42.72I. National Steel Drum Ltd. outfall. This is the only industry with a significant consumption of water. The Petrolia Public Utilities Commission reported that the water consumption varied from 500,000 to 2,000,000 gallons per month. The volume of waste being discharged from the plant to the Tank St. open drain would vary accordingly.

Chemical Oxygen Demand (COD) (ppm)	<u>Solids</u>			Phenols in (ppb)	pH at Lab.	Ether Solubles (ppm)	Anionic Detergents as ABS (ppm)
	Total (ppm)	Susp. (ppm)	Diss. (ppm)				
1,950	2,434	58	2,376	3,500	12.0	1,070	8.6

These results indicate that strong wastes were being discharged from the plant to a watercourse.

SYN 42.8D.I. Tank St. drain. Further sampling of the drain was carried out.

5-Day BOD (ppm)	Chemical Oxygen Demand (COD) (ppm)	<u>Solids</u>			pH at Lab	Ether Solubles (ppm)	Phenols in (ppb)
		Total (ppm)	Susp. (ppm)	Diss. (ppm)			
39	5,420	16,674	166	16,508	7.2	20	0

Serious pollution of the watercourse was again evident.

SYN 42.9I. A sample was obtained of spillage from one of several oil drilling operations in the vicinity of Tank St.

5-Day BOD (ppm)	Chemical Oxygen Demand (COD) (ppm)	<u>Solids</u>			pH at Lab	Ether Solubles (ppm)	Phenols in (ppb)
		Total (ppm)	Susp. (ppm)	Diss. (ppm)			
160	5,120	18,266	916	17,350	8.2	59	250

The laboratory analyses indicated that spillages from oil drilling operations are serious sources of pollution.

SYN 42.6W Hillsdale St. storm sewer.

5-Day BOD (ppm)	<u>Solids</u>			Anionic Detergents as ABS (ppm)	M.F. Coliform Count per 100 ml
	Total (ppm)	Susp. (ppm)	Diss. (ppm)		
24	362	48	314	2.6	40,000,000

It was quite evident that sanitary sewage was being discharged into the receiving stream.

SYN 42.8W Wood St. storm sewer. Characteristic sewage odours were present at the drain outfall.

5-Day BOD (ppm)	<u>Solids</u>			Anionic Detergents as ABS (ppm)	M.F. Coliform Count per 100 ml
	Total (ppm)	Susp. (ppm)	Diss. (ppm)		
155	1,048	674	374	16	147,000,000

This drain was contributing to the serious pollution of Bear Creek.

OUTFALLS DISCHARGING INTO BUTTERMILK CREEK

SYNW 40.6W Maple St. storm sewer.

5-Day BOD (ppm)	<u>Solids</u>			Anionic Detergents as ABS (ppm)	M.F.Coliform Count per 100 ml
	Total (ppm)	Susp. (ppm)	Diss. (ppm)		
66	1,024	660	364	9.0	11,000,000

It was evident that serious pollution of the drain had occurred as a result of sanitary sewer connections.

BEAR CREEK

Samples obtained at the time of the investigations revealed that Bear Creek deteriorated as it flowed through the Town of Petrolia.

Sampling Point No	Location	5-Day BOD (ppm)	Total (ppm)	Solids		pH at Lab
				Susp. (ppm)	Diss. (ppm)	
SYN 45.2	Above Petrolia	2.3	464	32	432	8.1
SYN 42.5	At Petrolia St.	2.9	1,006	41	965	8.3
SYN 41.6	South of Petrolia	6.4	1,432	85	1,347	8.0
Sampling Point No	Location	Phenols in (ppb)	Ether Solubles (ppm)	Anionic Detergents as ABS		M.F.Coliform Count per 100 ml
				(ppm)		
SYN 45.2	Above Petrolia	0	4	0.0		120
SYN 42.5	At Petrolia St.	0	5	0.2		11,000
SYN 41.6	South of Petrolia	15	8	0.5		42,000

BUTTERMILK CREEK

Serious pollution of Buttermilk Creek, a tributary of Bear Creek, was evident as it flowed into Petrolia from the Township of

Enniskillen.

Sampling Point No	Location	5-Day BOD (ppm)	Total (ppm)	SOLIDS		pH at Lab.
				Susp. (ppm)	Diss. (ppm)	
SYNW 41.3	North of Petrolia	105	23,158	166	22,992	8.9
SYNW 40.5	West of Petrolia	6.0	16,414	42	16,372	9.0

Sampling Point No	Location	Ether Solubles (ppm)	Phenols in ppb	Anionic Detergents as ABS (ppm)	M.F. Coliform Count per 100 ml
SYNW 41.3	North of Petrolia	32	0	0.4	10,000
SYNW 40.5	West of Petrolia	14	20	2.1	140,000

OIL POLLUTION

Investigations also revealed that certain oil drilling operations were contributing to the pollution of watercourses in the Town of Petrolia.

Approximately 12 wells located in the north end of Petrolia and in the Township of Enniskillen, were spilling oil into the Tank Street open drain. The wells were reported to be operated by De Meyers Limited.

Similarly, approximately 20 wells located in the Township of Enniskillen and operated by Mr. F. Edwards, were contributing to the pollution of Buttermilk Creek.

Oil drilling operations previously carried out south of Bear Creek had been discontinued but could possibly be resumed in the future. Reference is made to complaints previously received by the Commission regarding the runoff of oil wastes from the old Canadian Oil Company property to Buttermilk Creek. Mr. Arnold Thompson of Petrolia, reportedly has an agreement with the Sun Oil Company Limited to dispose of certain wastes from a Sarnia refinery. Approximately 5,000 to 8,000 gallons per month are disposed in underground tanks. The tanks, which are approximately 30 feet in diameter and 40 to 60 feet in depth, were constructed some 75 years ago for the storage of oil. The tanks were constructed of wood and seal lined with clay. There are approximately 25 tanks on the property. There was no evidence of significant runoff from this area to Buttermilk Creek at the time of inspection. Mr. Thompson was interviewed during a previous investigation in April, 1964. At that time Mr. Thompson advised that the waste would be pumped to an abandoned oil well, when the tanks were full. Permission should be obtained from the Department of Energy and Resources, Drilling and Production Branch, for this operation.

SUMMARY

A water pollution survey of the Town of Petrolia on July 21, 1964 revealed that inadequately treated sanitary and industrial wastes were being discharged into Bear Creek and tributaries. This resulted in the serious pollution of the receiving watercourses.

Samples obtained of the six municipal storm drain effluents revealed serious pollution in all cases. This resulted from sanitary sewer connections from private and business premises to the storm drains. This problem will be eliminated when the proposed municipal sewage treatment system has been completed.

Approximately 32 oil drilling operations were discharging oil into the Tank St. open drain and Buttermilk Creek. The National Steel Drum Limited plant was also found to be contributing to the pollution of the Tank St. drain. Individual treatment of these wastes should be provided. These industrial waste problems are being referred to the Commission's Industrial Waste Branch for further study.

It should be noted that the oil industry has been predominant in the Petrolia area for many years. Large areas of land are saturated with oily deposits and a certain amount of this material will invariably reach the various watercourses with surface water runoff.

RECOMMENDATIONS

1. The Town of Petrolia should proceed without delay with the construction of the proposed municipal sewage collection and treatment system.

2. Adequate treatment of the oil wastes being discharged from various drilling operations should be provided by the owners of these operations.

3. The National Steel Drum Limited should provide adequate treatment of its wastes.

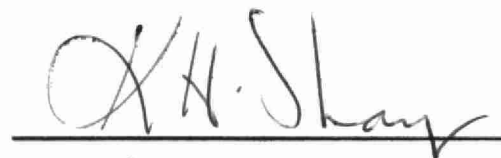
4. Before returning wastes resulting from the various oil operations into wells, permission should be obtained from the Department of Energy and Resources, Drilling and Production Branch.

All of which is respectfully submitted,

District Engineer


C.E. McIntyre

Approved by


K.H. Sharpe, Director.

elb

